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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,456	08/29/2003	Jin Udagawa	4641-65744	8756

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EXAMINER	
RUGGLES, JOHN S	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/651,456	UDAGAWA ET AL.	
	Examiner	Art Unit	
	John Ruggles	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *21* is/are withdrawn from consideration.

5)☐ Claim(s) *none* is/are allowed.

6)☒ Claim(s) *1-4 and 6-20* is/are rejected.

7)☒ Claim(s) *5 and 10-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/15/04 & 4/28/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicants' election **without** traverse of Group I (claims 1-20) in the reply filed on 6/24/05 is acknowledged.

Claim 21 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention (Group II).

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "C.O." in Figure 5 has been used to designate both (i) the crossover situated on the optical axis Ax at the blanking diaphragm 7 (described at page 3 lines 3-4) and (ii) the crossover of the patterned beam on the optical axis Ax at the back focal plane of the first projection lens 15 (also called the rear focal plane, described at page 5 lines 17-21).

The drawings are also objected to because Figure 2(C) shows 4 signal peaks for the left-most bar-code element 84' and 10 signal peaks for the right-most bar-code element 84', which do not correspond to the description of this figure at page 16 line 26 to page 17 line 2 (that requires only 3 signal peaks for the left-most bar-code element 84' and only 6 peaks for the right-most bar-code element 84').

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing

should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figures 6(A), 6(B), 6(C), 7(A), 7(B), and 7(C) are described as being conventional at page 9 line 22 to page 10 line 18 and page 14 lines 17-28, therefore they should each be designated by a legend such as --Prior Art--, because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed

150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because: (1) line 7 includes the phrase "are disclosed" and (2) at line 15, "line" (singular) should be changed to --lines-- (plural). Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities: (1) at page 5 line 8, "FIG. 4" should be changed to --FIG. [[4]] 5--, in order to correspond with the proper prior art figure described by this passage and (2) at page 12 lines 18-19, "microlithographic-exposure apparatus are" should be changed to --a microlithographic [[-]] exposure apparatus [[are]] is--.

Appropriate correction is required.

Claim Objections

Claims 10-15 are objected to because of the following informalities: in claim 10, "the each high-scattering region" should be changed to --[[the]] each high-scattering region--. Appropriate correction is required. Claims 11-15 depend on claim 10.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In each of claims 11-13, the phrase "the multiple edges" lacks proper antecedent basis and is further unclear about whether this phrase refers to either (1) all or (2) only some of the --at least three edges-- recited in claim 10, on which each of claims 11-13 depends. For the purpose of this Office action, the phrase "the multiple edges" in each of claims 11-13 is interpreted broadly to mean --*at least some of* the at least three edges--. Claims 14-15 depend on claim 13.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 and 6-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujimoto et al. (US Patent Application Publication 2003/0044730).

Fujimoto et al. teach a substrate-engraving type chromeless phase shift mask (PSM) or reticle having a character/symbol section engraved in the form of a slit-shaped or a lattice-shaped pattern of concave grooves and a method of manufacturing it (title, abstract). The characters or symbols can be of any kind, including a bar code [0020, 0035-0036], for identifying the mask to be used in a drawing unit [0038] (such as a microlithographic exposure apparatus). The identification code in the character/symbol section is formed flush with the main mask pattern (e.g., for forming a circuit, etc. [0040]). Figures 1(a-d) show an exemplary symbol comprised of slit-shaped parallel concave grooves or channels in the mask substrate [0046-0049], very much like the instant Figure 2(A) bar code having multiple high-reflection-scattering regions separated by low-reflection-scattering regions. Variations of this character/symbol pattern (e.g., to form an identification code, etc.) include a lattice shape pattern configuration [0052] (understood to mean a combined pattern of 2 sets of parallel grooves or channels, each set perpendicular and overlapping with the other, to leave an array of several square pillars separated by parallel and perpendicular channels), which could form a bar code in the character/symbol section [0053] very much like that shown by instant Figure 4(A). The desired character/symbol groove or channel configuration and the main pattern section are both etched in the mask simultaneously through a resist patterned by an exposure apparatus, such as an electron beam drawing unit [0059-0062].

Applicants cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claims 1-4, 6-16, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishikata (US Patent 6,523,748).

Nishikata teaches a substrate for exposure, a readout method and apparatus for the substrate, an exposure apparatus, and a method for producing semiconductor devices using the exposure apparatus (title). Figure 1 shows an exposure apparatus incorporating an exposure substrate reader (col. 4 lines 41-44), a reticle library for keeping a plurality of reticles (exposure substrates) used during exposure, a reticle carrier and transport system, and an illumination optical system (col. 5 lines 4-19). An embodiment of the substrate for exposure is a patterned reticle or mask having plural bar codes BC1 and BC2 (shown in Figures 2 and 3) that are read by reflection, scattering, or transmission of light from a bar code reader (BCR) 9 at read positions 1 and 2, respectively (col. 5 line 57 to col. 6 line 7). Modifications for the plural bar codes on the reticle or mask specifically include a single identification bar code (col. 7 lines 21-47) or identification marks in other formats (besides a one-dimensional bar code having only bars and spaces arranged in a single row), such as a two-dimensional identification code (col. 9 lines 27-34, which reads on a reticle identification code having multiple high-reflection-scattering regions separated by low-reflection-scattering regions). Alternative radiation from the optical illumination system exposure source for exposure through a reticle with bar codes specifically includes x-ray, electron beam, or any of various wavelengths from G-line (436 nm) to F_2 laser (157 nm) light (col. 9 lines 57-64).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikata (US Patent 6,523,748) in view of Hirayanagi (US Patent 6,521,900).

Nishikata does not specifically teach a reticle with an identification code having a line and space pattern pitch that is below the resolution of the optical reader system.

Hirayanagi teaches charged particle beam (CPB) microlithography and alignment marks for use therein having an array of multiple sub-elements at a period or pitch that is not resolvable by an optical sensor, but still resolvable by a CPB-based sensor (title, abstract). The alignment marks can be on a patterned reticle or mask for exposure of a substrate (e.g., semiconductor wafer, etc.) in optical microlithography and/or CPB (e.g., electron beam, etc.) microlithography (col. 1 lines 7-18). The alignment mark is preferably a line and space pattern including various combinations of elements and sub-elements (col. 3 lines 30-32). The optical sensor only detects the sub-elements together to make up each element of the alignment mark, so that the sub-elements are not individually sensed as significant noise, which improves the detection accuracy of the optical sensor (col. 4 lines 3-10 and col. 5 lines 2-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention in the reticle having a two-dimensional optically readable identification code and corresponding

exposure apparatus taught by Nishikata to use a reticle including a two-dimensional optically readable identification code with a line and space pattern of sub-elements having a period or pitch that is below the resolution of the optical reader system in order to improve the detection accuracy of the optical reader or sensor, as taught by Hirayanagi.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. (US Patent Application Publication 2003/0044730) in view of Hirayanagi (US Patent 6,521,900).

Fujimoto et al. do not specifically teach a reticle with an identification code having a line and space pattern pitch that is below the resolution of the optical reader system.

The teaching of Hirayanagi is discussed above.

It would have been obvious to one of ordinary skill in the art at the time of the invention in the mask or reticle having a character/symbol section engraved in the form of a lattice-shaped pattern of concave grooves taught by Fujimoto et al. to use a reticle including a lattice-shaped optically readable identification code with a line and space pattern of sub-elements having a period or pitch that is below the resolution of the optical reader system in order to improve the detection accuracy of the optical reader or sensor, as taught by Hirayanagi.

Applicants cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Fujimoto et al. (US Patent Application Publication 2003/0044730) in view of Batterman et al. (US Patent

5,262,623); or alternatively over Nishikata (US Patent 6,523,748) in view of Applicants' admitted prior art and further in view of Batterman et al. (US Patent 5,262,623).

Neither Fujimoto et al. nor Nishikata specifically teach a reticle with an identification code comprising a checkerboard pattern of projections and recesses.

However, Batterman et al. teach that various checkerboard identification code patterns have been known for some time in the bar code reader (BCR) art (e.g., especially when the BCR utilizes a two-dimensional image capture optical system, etc., abstract), as shown by Figures 2a, 2b, 2c, 2d, and 6 (col. 3 lines 37-60 and col. 5 lines 7-26). Figure 2a specifically shows a two-dimensional "checkerboard" formation pattern having plural rows of alternating light (reflective) spaces 24A and dark (non-reflective) marks 26A at a predetermined frequency, that is optically detectable (e.g., by a BCR, etc., col. 3 lines 37-44).

Furthermore, Applicants have admitted at instant page 9 lines 22-27 that it was already conventionally known prior art at the time of the invention to make a reticle identification code (e.g., a bar code, etc.) having reflective edges between relatively non-reflective projections and recesses etched into the reticle substrate, as shown by instant Figures 7(A), 7(B), and 7(C).

It would have been obvious to one of ordinary skill in the art at the time of the invention in the mask or reticle having a character/symbol section (e.g., as a two-dimensional bar code, etc.) engraved in the form of a lattice-shaped pattern of concave grooves to form projections and recesses with different reflectivity as taught by Fujimoto et al., or alternatively, in the reticle having a two-dimensional optically readable identification code (e.g., bar code, etc.) with reflective edges between relatively non-reflective projections and recesses, as taught by Nishikata in view of Applicants' admitted prior art, to use a reticle including a two-dimensional

or lattice-shaped optically readable identification code (e.g., bar code, etc.) in a "checkerboard" pattern having plural rows of alternating reflective regions and relatively non-reflective regions (which has been known for some time in the bar code reader (BCR) art), as taught by Batterman et al.

Applicants cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Fujimoto et al. (US Patent Application Publication 2003/0044730) in view of Batterman et al. (US Patent 5,262,623) and further in view of Hirayanagi (US Patent 6,521,900); or alternatively over Nishikata (US Patent 6,523,748) in view of Applicants' admitted prior art, further in view of Batterman et al. (US Patent 5,262,623), and further in view of Hirayanagi (US Patent 6,521,900).

Neither Fujimoto et al., Batterman et al., nor Nishikata specifically teach a reticle with an identification code comprising a checkerboard pattern of projections and recesses having a pattern pitch that is below the resolution of the optical reader system.

The teachings of Fujimoto et al., Batterman et al., Hirayanagi, Nishikata, and Applicants' admitted prior art are all discussed above.

It would have been obvious to one of ordinary skill in the art at the time of the invention in the mask or reticle having a character/symbol section (e.g., as a two-dimensional bar code, etc.) engraved in the form of a lattice-shaped pattern of concave grooves to form a checkerboard pattern of projections and recesses with different reflectivity as taught by Fujimoto et al. and

Batterman et al., or alternatively, in the reticle having a two-dimensional optically readable identification code (e.g., bar code, etc.) having reflective edges between relatively non-reflective projections and recesses, as taught by Nishikata in view of Applicants' admitted prior art, to use a reticle including a two-dimensional optically readable identification code in the form of a checkerboard pattern of projections and recesses forming sub-elements having a period or pitch that is below the resolution of the optical reader system in order to improve the detection accuracy of the optical reader or sensor (e.g., BCR, etc.), as taught by Hirayanagi.

Applicants cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: while teaching a lithography reticle or mask with a reticle identification code (e.g., bar code, etc.) having high-scattering multiple regions comprising multiple points, the prior art does not specifically teach that the multiple points are defined by respective pyramidal or conical projections, as recited in claim 5.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 571-272-1390. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John Ruggles
Examiner
Art Unit 1756

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